Unilateral left pulmonary Tl-201 uptake on raw data images of dual-isotope gated SPECT due to pulmonary infiltrates and atelectasis

Wei-Jen Shih, MD, and Primo Milan, MD

Diffuse pulmonary thallium 201 uptake on dual-isotope gated single photon emission computed tomography (SPECT) at rest is usually bilateral and related to coronary artery disease (CAD). We present a patient who had unilateral left pulmonary Tl-201 uptake and normal left ventricular (LV) perfusion and function. The abnormal diffuse pulmonary Tl-201 uptake in the left lung corresponded to infiltrates and atelectasis on the concurrent radiograph and computed tomogram of the chest.

Case report. A 59-year-old man with diabetes mellitus complained of left chest pressure and underwent dipyridamole technetium 99m tetrofosmin and rest Tl-201 chloride gated cardiac SPECT. The images showed slight enlargement of the left ventricle with normal myocardial perfusion and increased pulmonary activity in the left lung (Figure 1A); LV ejection fraction was calculated to be 64%, and end-systolic volume and end-diastolic volume were calculated to be 36 mL and 100 mL, respectively. On the raw data images, diffusely increased activity in the left lung and elevation of the right hemidiaphragm (Figure 1B) were noted. A concurrent chest radiograph show congenital eventration of the right hemidiaphragm, cardiomegaly, emphysema, and infiltrate/atelectatic lesions in the left lung (Figure 1C); computed tomography images of the chest showed multifocal alveolar opacity consistent with chronic infiltrates in the left lung and two opacities with contrast enhancement in the left lower lung consistent with compressive atelectasis (Figure 1D). The patient then underwent antibiotic regimen therapy.

Discussion. Our patient’s extracardiac Tl-201 activity presents a unique characteristic, namely diffuse involvement in one lung (left) as shown on raw data images (Figure 1B); there was abnormal activity in the left lung on SPECT (Figure 1A). Increased pulmonary uptake during stress or dipyridamole infusion is usually bilaterally diffuse uptake in association with a number of perfusion defects on Tl-201 images; bilateral pulmonary uptake is related to the severity of CAD, LV dysfunction, and poor prognosis. Increased Tl-201 lung uptake in the presence of normal perfusion of the LV wall has been reported to be an additional diagnostic clue for diastolic dysfunction in patients undergoing evaluation for suspected CAD. These abnormal pulmonary findings are symmetrically bilateral; our patient’s uptake was unilateral.

Diffuse and unilateral Tl-201 uptake in the right lung on an anterior planar image due to pulmonary edema on exercise treadmill testing has been reported. The cause of the pulmonary uptake is associated with pulmonary edema at stress. Our patient’s unilateral increase in radioactivity is diffuse and appears to be related to the correspondent pulmonary infiltration in the left lung; one of the patient’s symptoms was chest pressure, which was the reason for referral to undergo cardiac gated SPECT.

A focal area of Tl-201 uptake in the lung can be a malignancy or a benign lesion. Increased resting Tl-201 lung uptake bilaterally and diffusely in patients with known or suspected coronary artery disease has been reported. Our patient with pneumonic changes had rather diffuse uptake.

In summary, unilateral pulmonary Tl-201 uptake is a shared manifestation as compared with the previously reported case. The difference in our patient’s status is that lung uptake in our patient occurred without exercise, seen on raw data images, and involved the left lung and not the right lung (Figure 1B). The cause of our patient’s lung uptake was pulmonary infiltrates with lung atelectasis. SPECT images of our patient showed normal myocardial perfusion and normal LV ejection fraction. Unilateral pulmonary Tl-201 uptake in the left lung on raw data images at rest due to pulmonary infiltrates and atelectasis has not been reported previously. With normal myocardial perfusion and normal LV systolic function, unilaterally diffuse radioactive Tl-201 uptake with may be considered extracardiac in origin, as was the case in our patient’s pneumonic infiltrative changes.
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References


